CLAIMS

1. A composite mat and sheet structure for installation atop a subfloor directly beneath a layer of cementicious material poured to harden in situ atop the composite mat and sheet structure for venting vapor including water vapor therefrom during hardening of the cementicious material, and for substantially preventing liquid water from the cementicious material from coming into contact with the subfloor, comprising 1) a flexible, semi-rigid, open-space mat of polymeric material for being installed atop the subfloor and through which vapor including water vapor and air can flow with ease, and 2) a relatively thin sheet of barrier material bonded to upper portions of the mat for providing a barrier that is pervious to vapor including water vapor, but that is substantially impervious to liquid moisture so as to permit vapor from the layer of cementicious material poured atop the barrier to pass through the barrier and into the open-space mat for being vented through the mat while substantially blocking passage through the barrier of liquid moisture so as to substantially prevent liquid water from the layer of cementicious material poured atop the barrier from coming into contact with the subfloor.

2. The composite mat and sheet structure of Claim 1 wherein the mat includes tangled, intertwined, randomly oriented polymeric filaments that twist and turn so as to be spaced from each other along a majority of their lengths, with the filaments being connected at filament intersections that are randomly located, with spaced upper portions and lower portions of the filaments defining top surface portions and bottom surface portions of the mat that give the mat a substantially uniform thick-

ness, and with the sheet of barrier material being bonded to the top surface portions.

3. The composite mat and sheet structure of Claim 2 wherein the polymeric filaments are extruded polymer, and wherein the heat bonded connection of the filaments are formed at the filament intersections.

4. The composite mat and sheet structure of Claim 3 wherein the polymer is selected from among a group consisting of polyolefins, polyamides and polyvinyl chlorides.

5. The composite mat and sheet structure of Claim 2 wherein the substantially uniform thickness is within the range of about 1/4 inch to about 3/4 inch.

6. The composite mat and sheet structure of Claim 2 wherein the thickness of the combined mat and sheet structure is substantially uniform and is within the range of about 1/4 inch to about 3/4 inch.

7. The composite mat and sheet structure of Claim 1 wherein the barrier material is a film-like material pervious to water vapor and impervious to water in liquid form, and having a thickness of between about 0.010 inch to about 0.030 inch.

8. The composite mat and sheet structure of Claim 1 wherein at least a selected one of the mat and the sheet is treated with at least one of an anti-microbial agent and an anti-fungal agent.

9. The composite mat and sheet structure of Claim 1 wherein the mat includes tangled, intertwined,

randomly oriented polymeric filaments that twist and turn so as to be spaced from each other along a majority of their lengths, with the filaments being connected by heat bonding at filament intersections that are randomly located.

10. The composite mat and sheet structure of Claim 9 wherein the thickness of the combined mat and sheet structure is substantially uniform and is within the range of about 1/4 inch to about 3/4 inch.

11. The composite mat and sheet structure of Claim 1 wherein the composite mat and sheet structure has a substantially uniform width, has a length that is substantially greater than the substantially uniform width, and is sufficiently flexible to permit the composite mat and sheet structure to be rolled up along its length for delivery to an installation site in roll form.

12. A flooring system comprising a subfloor, a flexible, semi-rigid, open-space mat of tangled polymeric filaments overlying the subfloor, a sheet of barrier material overlying the mat, and a layer of hardenable material poured atop the sheet of barrier material to harden in situ atop the sheet of barrier material, wherein the sheet of barrier material is pervious to vapor but is substantially impervious to liquid so as to permit vapor to pass through the sheet of barrier material and to be vented through the open-space mat during hardening of the hardenable material, and to substantially prevent liquid from passing through the sheet of barrier material and from coming into contact with the subfloor.

13. The flooring system of Claim 12 wherein the sheet of barrier material is bonded to upper portions of the mat.

14. The flooring system of Claim 12 wherein the polymeric filaments that form the mat are selected from a group consisting of polyolefins, polypropylenes, polyethylenes, polyamides and polyvinylchlorides, and the filaments of the mat are heat bonded at intersections thereof that are randomly located throughout the mat.

15. The flooring system of Claim 12 wherein the hardenable material is gypsum concrete.

16. A composite mat and sheet structure for installation in a space between a layer of flooring material and a subfloor for venting vapor from the space, and for substantially preventing liquid from moving downwardly through the space and into contact with the subfloor, comprising an open-space mat of polymeric fiber through which vapor can flow with ease, and a sheet of barrier material overlying the mat to provide a barrier that is pervious to vapor but substantially impervious to liquid so as to permit vapor to be vented through the open-space mat from the space atop the subfloor while substantially blocking downward passage of liquid from atop the sheet of barrier material to thereby substantially prevent such liquid from coming into contact with the subfloor.

17. The mat and sheet structure of Claim 16 wherein the mat includes tangled, intertwined, randomly oriented polymeric filaments that twist and turn so as to be spaced from each other along a majority of the lengths of the filaments, with the filaments being connected at filament intersections that are randomly located, with

spaced upper portions and lower portions of the filaments defining top surface portions and bottom surface portions of the mat that give the mat a substantially uniform thickness, and with the sheet of barrier material being bonded to the top surface portions.

18. The composite mat and sheet structure of Claim 17 wherein the polymeric filaments are extruded polymer, and wherein the heat bonded connection of the filaments are formed at the filament intersections.

19. The composite mat and sheet structure of Claim 18 wherein the polymer is selected from among a group consisting of polyolefins, polypropylenes, polyethylenes, polyamides and polyvinylchlorides.

20. The composite mat and sheet structure of Claim 17 wherein the substantially uniform thickness is within the range of about 1/4 inch to about 3/4 inch.

21. The composite mat and sheet structure of Claim 17 wherein the thickness of the combined mat and sheet structure is substantially uniform and is within the range of about 1/4 inch to about 3/4 inch.

22. The composite mat and sheet structure of Claim 16 wherein at least a selected one of the mat and the sheet is treated with at least one of an anti-microbial agent and an anti-fungal agent.

23. The composite mat and sheet structure of Claim 16 wherein the mat includes tangled, intertwined, randomly oriented polymeric filaments that twist and turn so as to be spaced from each other along a majority of their lengths, with the filaments being connected by heat

bonding at filament intersections that are randomly located.

24. The composite mat and sheet structure of Claim 23 wherein the thickness of the combined mat and sheet structure is substantially uniform and is within the range of about 1/4 inch to about 3/4 inch.

25. The composite mat and sheet structure of Claim 16 wherein the composite mat and sheet structure has a substantially uniform width, has a length that is substantially greater than the substantially uniform width, and is sufficiently flexible to permit the composite mat and sheet structure to be rolled up along its length for delivery to an installation site in roll form.

26. A composite mat and sheet structure for installation in a space between a layer of flooring material and a subfloor for venting vapor from the space, and for substantially preventing liquid from moving downwardly through the space and into contact with the subfloor, comprising an open-space mat of polymeric fiber through which vapor can flow with ease, and a sheet of barrier material overlying the mat to provide a barrier that is impervious to liquid so as to substantially block downward passage through the space of liquid from atop the sheet of barrier material to thereby substantially prevent such liquid from coming into contact with the subfloor.

27. A composite mat and sheet structure for installation in a space between a layer of flooring material and a subfloor for venting vapor from the space, and for substantially preventing liquid that includes gypsum concrete in liquid form from moving downwardly through the space and into contact with the subfloor, comprising an

open-space mat of polymeric fiber through which vapor can flow with ease, and a sheet of barrier material overlying the mat to provide a barrier that is impervious to said liquid so as to substantially block downward passage through the space of said liquid from atop the sheet of barrier material to thereby substantially prevent said liquid from coming into contact with the subfloor.